

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,911,108 B2
APPLICATION NO. : 10/037414
DATED : June 28, 2005
INVENTOR(S) : Sarmiento

Page 1 of 5

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title page consisting of Fig 1a should be deleted and replaced with the attached title page

In the Drawings

FIG. 1a, Sheet 1 of 12

Delete Drawing Sheet 1 and substitute therefore the Drawing Sheet, consisting of Figs. 1a and 1b, as shown on the attached page

Fig. 7a, Sheet 7 of 12

Delete Drawing Sheet 7 and substitute therefore the Drawing Sheet, consisting of Figs. 7a and 7b, as shown on the attached page

In the Claims

Column 9, line 36, Claim 1

Delete "or",
Insert --of--

Column 9, line 57, Claim 6,

Before "prescribed interval",
Insert --a--

Column 10, line 11, Claim 13

Delete ", "

Column 10, line 16, Claim 15

Delete ", "

Column 10, line 19, Claim 15

Delete "non coherent",
Insert --non-coherent--

Column 10, line 31, Claim 15

Delete "hear",
Insert --heat--

Column 10, line 40, Claim 16

Delete "The apparatus of claim 15,"
Insert --An apparatus as in claim 15,--

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Page 2 of 5

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 12, line 19, Claim 42

Delete "and",
Insert --or--

Column 12, line 23, Claim 44

Delete "poser",
Insert --power--

Column 12, line 26, Claim 45

Delete "lense",
Insert --lens--

Column 12, line 29, Claim 46

Delete "lense",
Insert --lens--

Signed and Sealed this

Third Day of October, 2006

A handwritten signature in black ink, appearing to read "Jon W. Dudas". The signature is stylized with a large, looped initial "J" and a cursive "Dudas".

JON W. DUDAS
Director of the United States Patent and Trademark Office

(12) **United States Patent**
Sarmiento

(10) Patent No.: **US 6,911,108 B2**
(45) Date of Patent: **Jun. 28, 2005**

(54) **PHOTON WELDING DEVICES FOR JOINING PLASTIC PARTS**

(75) Inventor: **Pedro A. Sarmiento, San Diego, CA (US)**

(73) Assignee: **Quantum Group, Inc., San Diego, CA (US)**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **10/037,414**

(22) Filed: **Jan. 4, 2002**

(65) **Prior Publication Data**

US 2003/0094240 A1 May 22, 2003

Related U.S. Application Data

(60) Provisional application No. 60/260,012, filed on Jan. 6, 2001.

(51) Int. Cl.⁷ **B32B 31/20**

(52) U.S. Cl. **156/272.2; 156/379.8; 156/580; 219/243; 219/385**

(58) Field of Search **156/379.6, 379.8, 156/580, 272.2; 219/243, 385; 250/504 R; 362/551, 580, 581**

(56) **References Cited**

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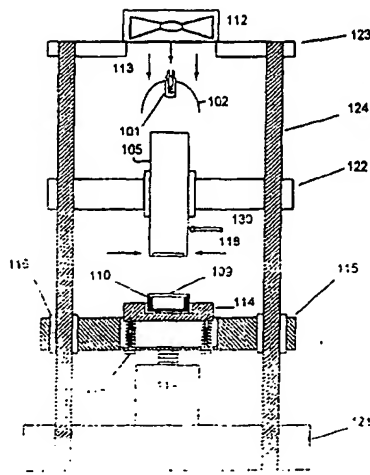
Primary Examiner—John T. Haran

(74) *Attorney, Agent, or Firm*—Christie, Parker & Hale, LLP

(57) **ABSTRACT**

Photon welding devices of this invention comprise a non-coherent photon source, and a light pipe coupled to the photon source at one end. A thin mask is positioned at another end of the light pipe that defines a weld location for photon delivery. A work piece to be bonded by the device comprises a top layer of transparent plastic and a base layer of absorbing plastic. The thin mask is in the form of a reflective coating positioned on the end of the light pipe over all surfaces that are not in contact with the work piece. A device includes a member that imposes a controlled, compressive force to the work piece while it is being welded and during a short time thereafter. The device also includes a member that maintains a desired alignment of the light pipe, top layer of the work piece, and base layer of the work piece during the bonding cycle.

48 Claims, 12 Drawing Sheets



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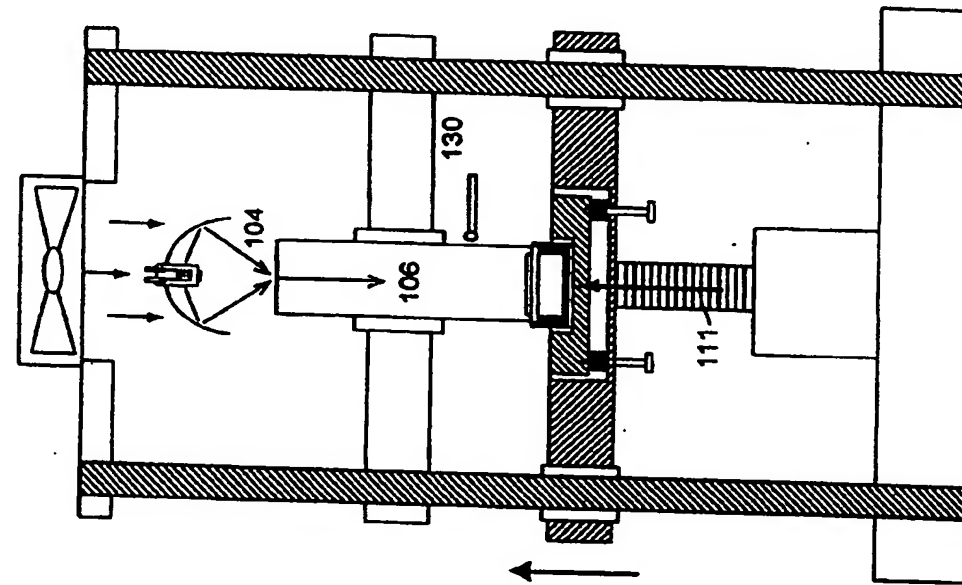


Figure 1b

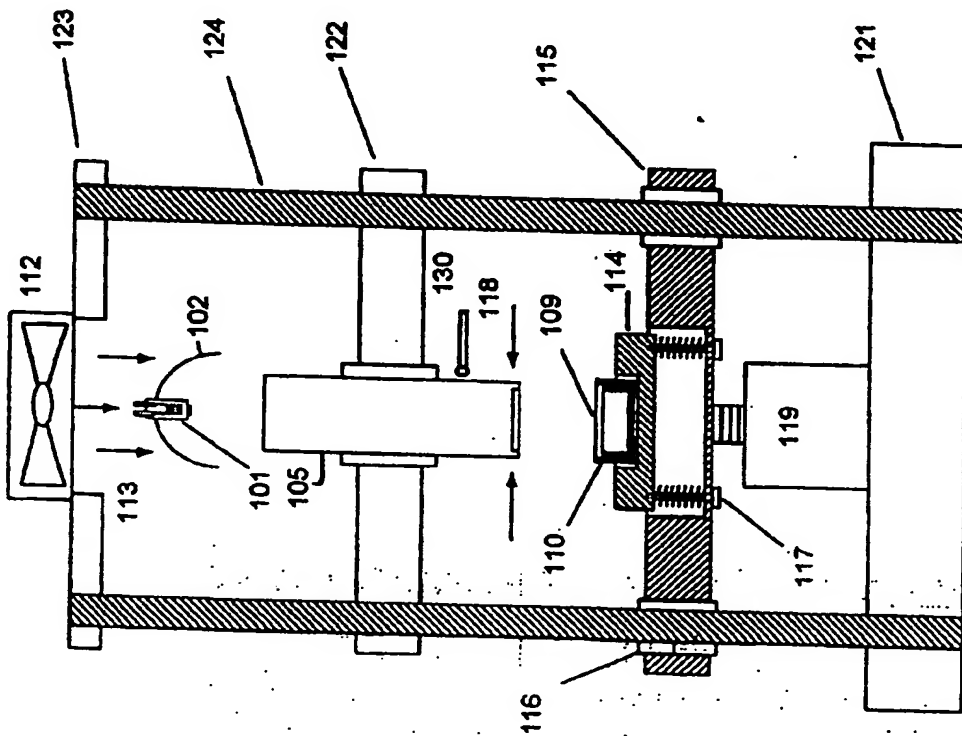


Figure 1a

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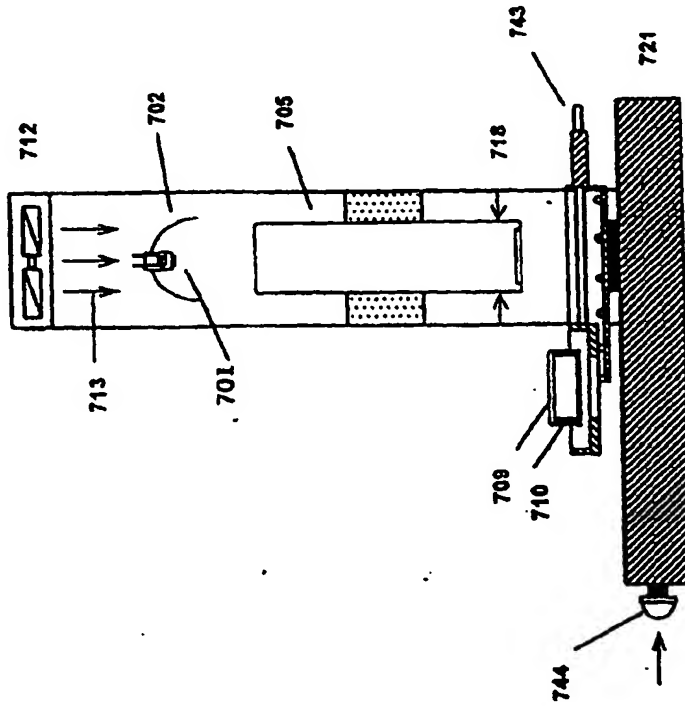


Figure 7b

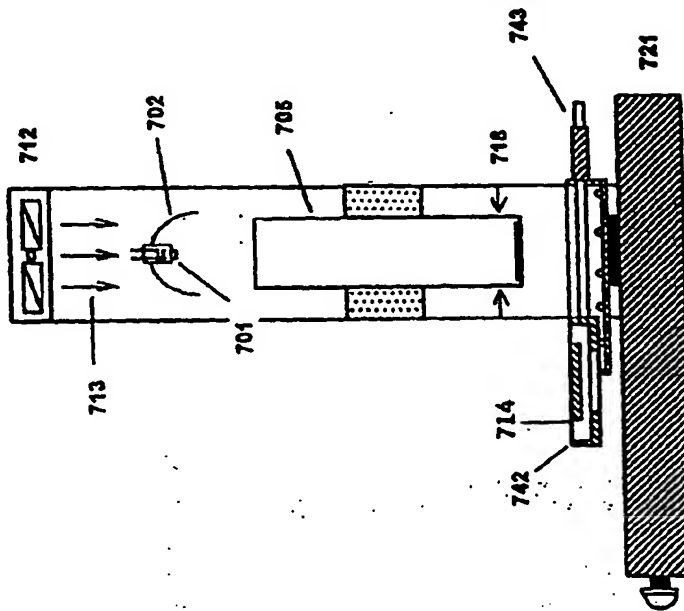


Figure 7a